



Pilot Project

“Design and testing of a multipurpose transboundary groundwater monitoring network in the Extended Drin River Basin”

Main outputs and contribution to SDGs

Morgana Marku

Albania/Water Resources Management Agency

1. Description of the pilot project

- The project aimed to enable transboundary cooperation and integrated water resources management in the extended Drin River Basin, by designing and testing a multi-purpose (transboundary) groundwater monitoring (Albania & Montenegro) in line with EU legislation

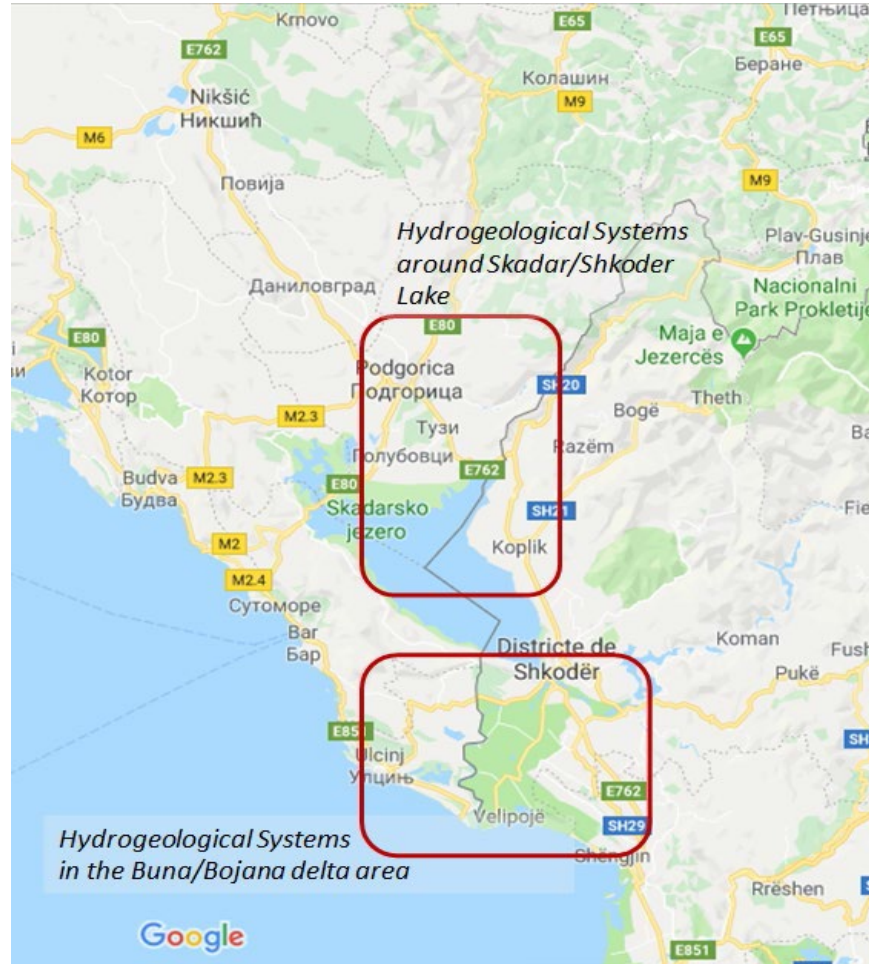


Figure 1- General map of the studied area, locating the hydrogeological systems those in Buna/Bojana delta area. around the Skadar/Shkoder Lake

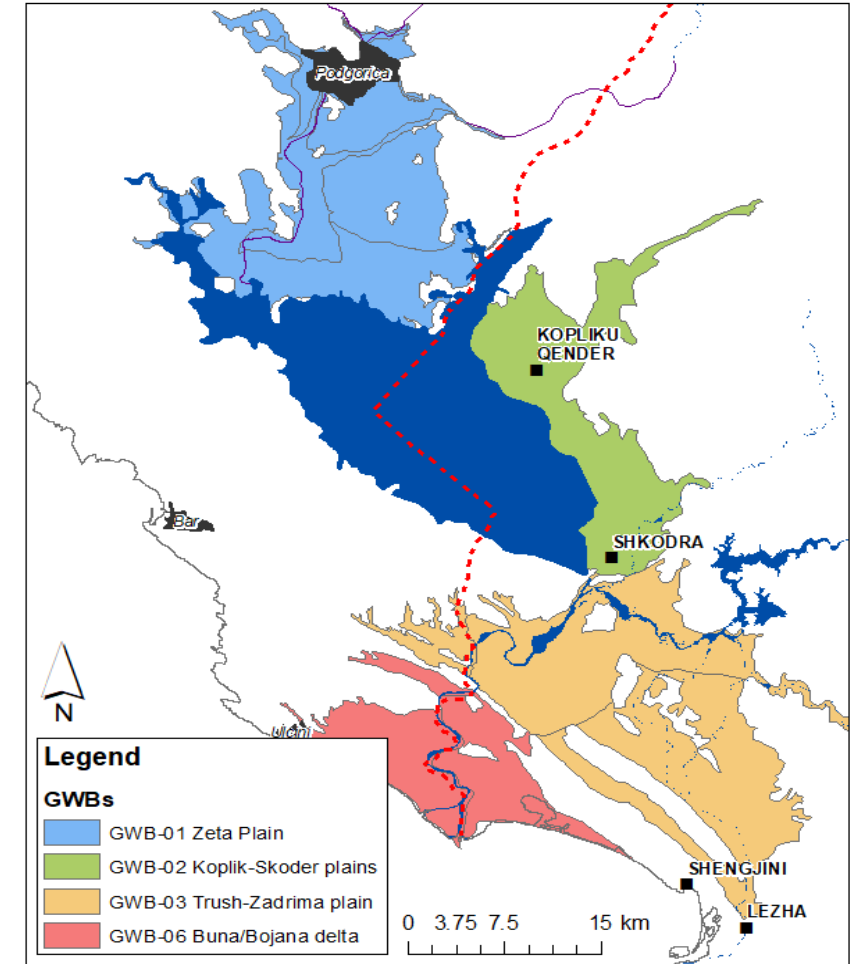


Figure 2- Groundwater bodies that are object of this study; i.e., those in alluvial and fluvio-deltaic plains of the area

1. Description of the pilot project

- Main outputs

The EU WFD states that the design of a monitoring network should be based on the “characterization, assessment of risk and building of a conceptual model of the groundwater system, in which the general scheme ‘recharge-pathway-discharge’ is known”.

Main outputs of the project:

- Hydrogeological Conceptual Model of the Skadar/Shkoder and Buna/Bojana Transboundary Aquifer System
- Risk assessment
- Vulnerability Maps
- Monitoring Network Design/monitoring locations/equipment and methods
- Monitoring testing



- Multidimensional assessment

- **Hydrological information**

- Geology
- Hydrogeology
- Water balance

- **Socio-economical information**

- Groundwater use
- Sources of pollution
- Pressures and Impacts

- **Environmental information**

- Hydrochemistry and groundwater quality
- Groundwater Depended Ecosystems
- Landscape and protected areas.

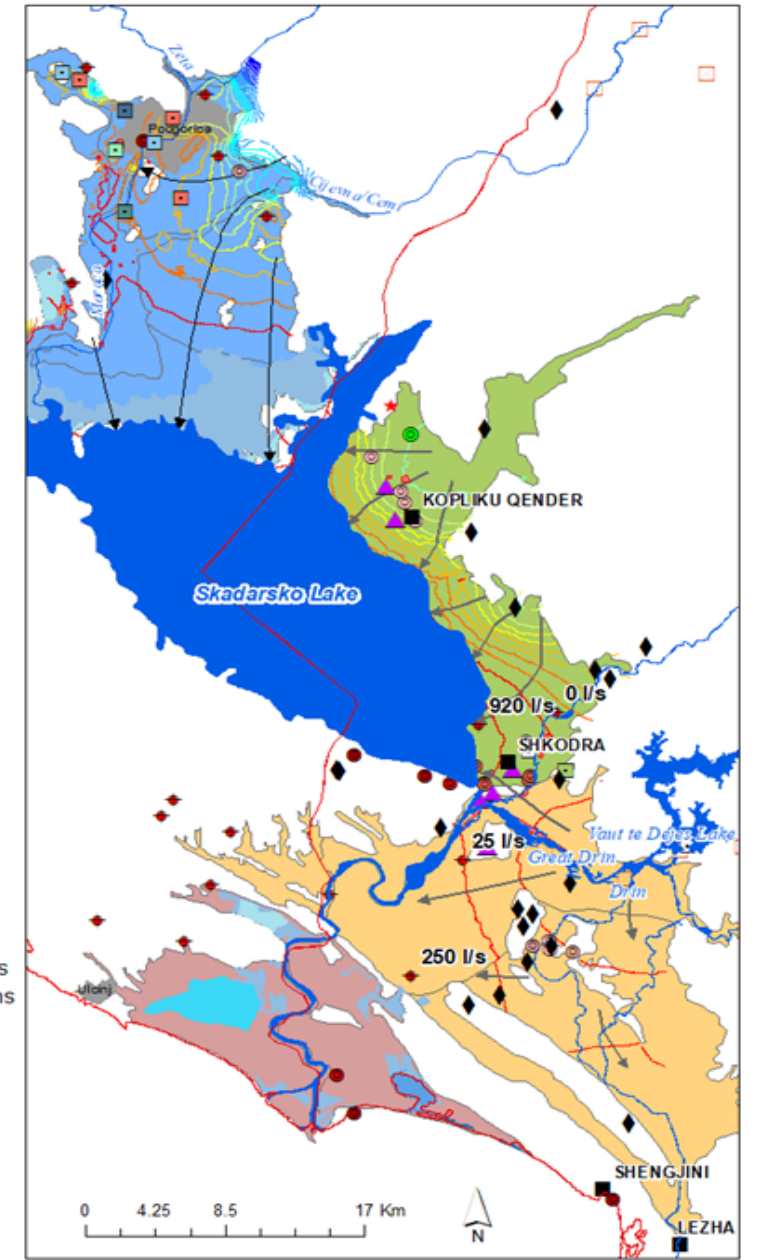
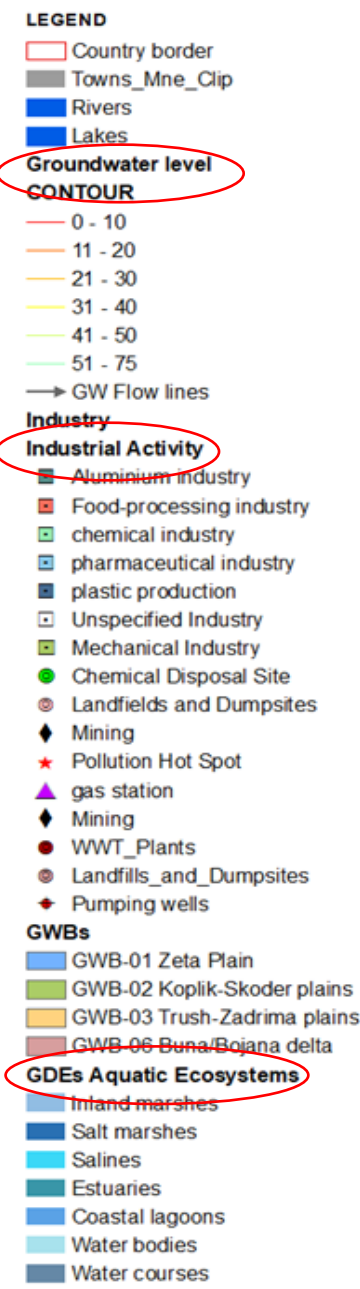


Figure 3- Conceptual Model

- Aquifer Vulnerability maps

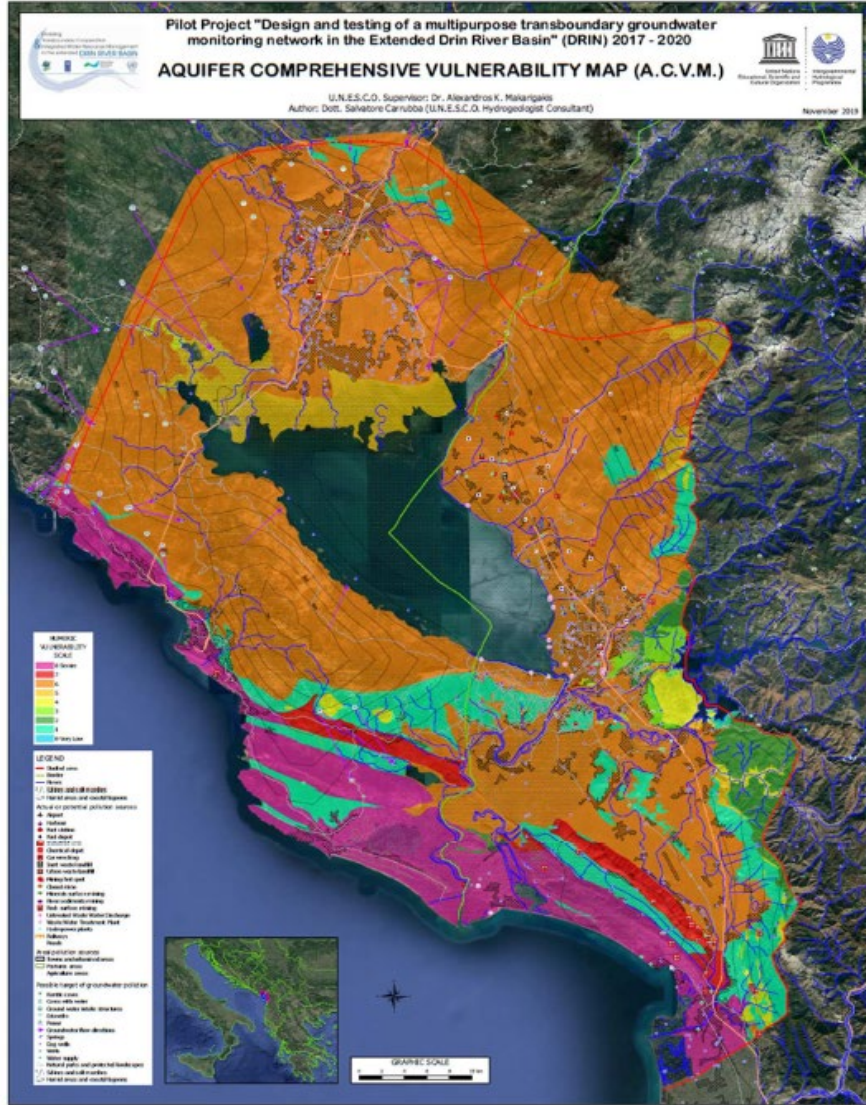


Figure 4- Aquifer vulnerability map

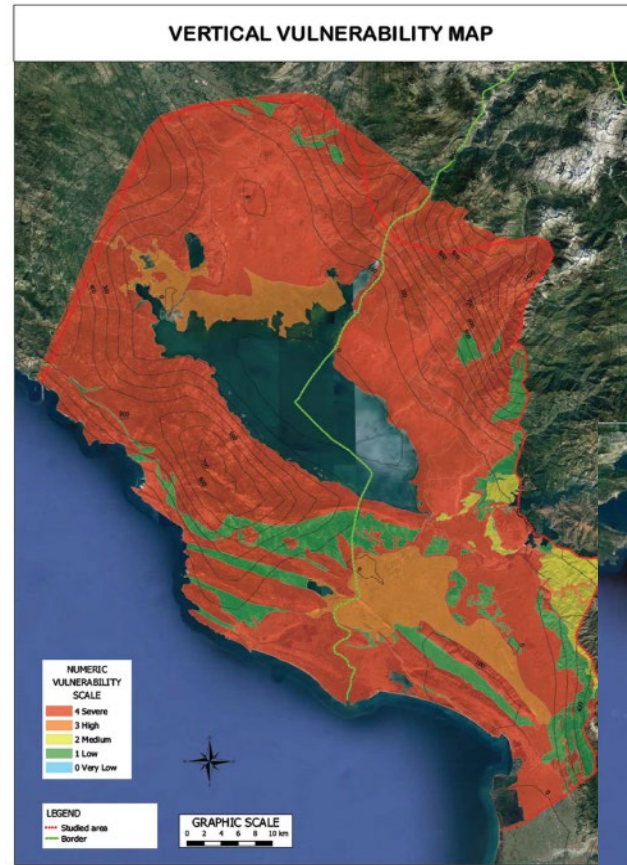


Figure 5- Vertical Vulnerability map

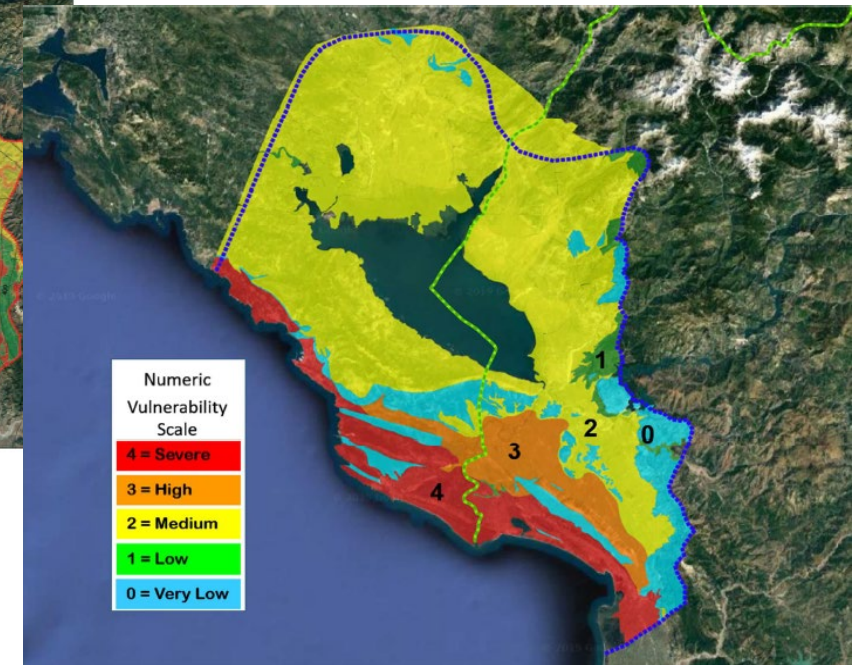


Figure 6- Horizontal Vulnerability map

- Monitoring zones proposed in line with the EU WFD

GWB-01 Zeta plain

- ✓ Moraca River alluvial plain
- ✓ Podgorica urbanized area
- ✓ Cijevna river
- ✓ Groundwater seepage to Skadar/Shkoder Lake

GWB- 02 Koplik-Shkoder plain

- ✓ Groundwater withdrawals
- ✓ Groundwater seepage to Skadar/Shkoder Lake

GWB- 03 Trush and Zadrina plains

- ✓ Groundwater withdrawals
- ✓ Groundwater/surface water relationship

GWB- 06 Buna/Bojana delta area

- ✓ Seawater intrusion
- ✓ Groundwater Dependent Ecosystems

- Monitoring network types

- Quantitative Monitoring
- Surveillance Monitoring
- Operational Monitoring
- Drinking Water Protected Areas Monitoring

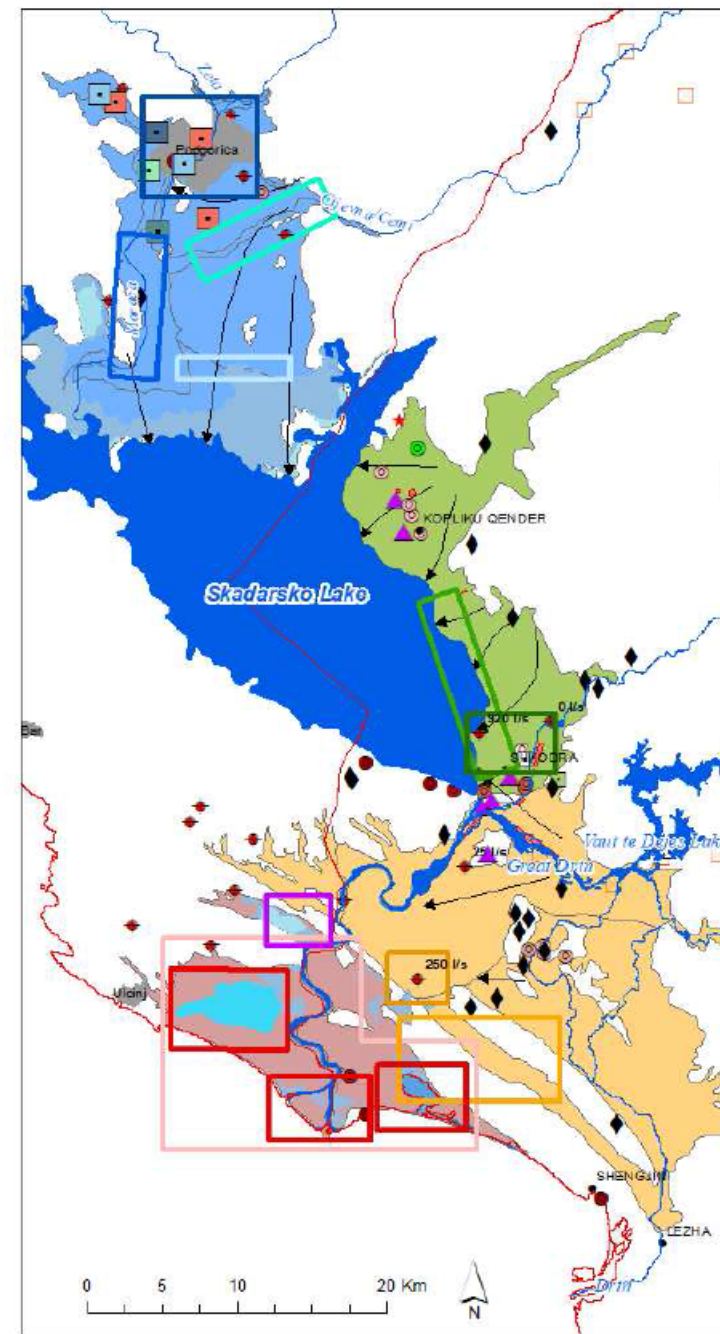


Figure 7- Location of priority groundwater monitoring areas for each proposed groundwater body

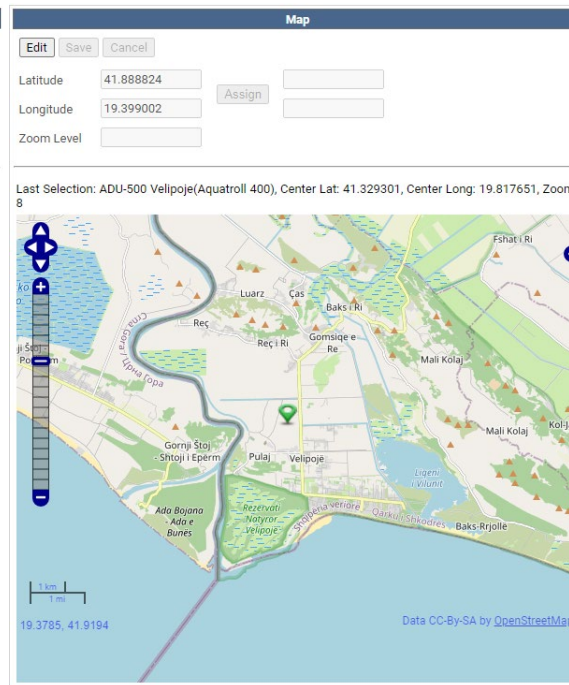
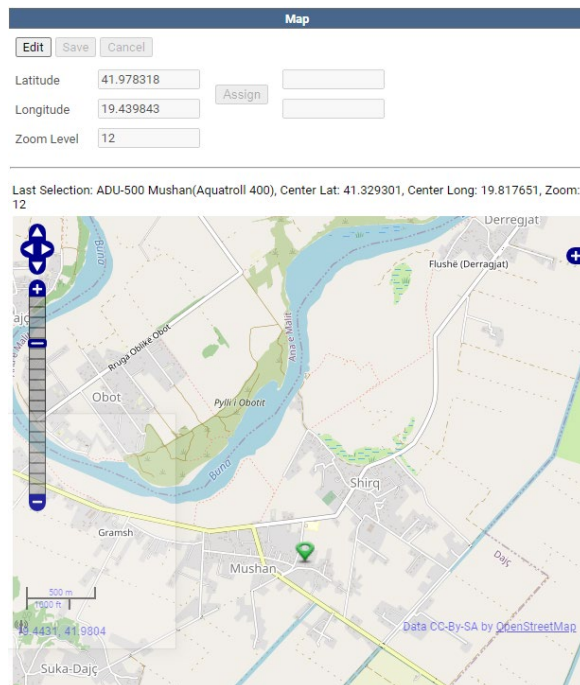
- Pilot project testing in Buna/Bojana transboundary aquifer

On Albanian side 2 devices Aquatroll 400 have been installed;

- **Mushan** monitoring station;
- **Velipoje** monitoring station;
- There are monitored 6 components every 30 min;

- Data are accessible and used for monitoring and scientific Study by Albanian Geologic Survey and WRMA

Temp
Level
Cond
pH
ORP
DO



ID	Group	DeviceID	Device	Type	Channel	SMSDateTime	Value	Unit	dir	expans	rsaj	Long	Lat	File
24450730	Aquatroll 400	1760	ADU-500 Velipoje	RS485	Temp-C21	03/02/2022 13:07:24	16.622	°C						ADU-500_220203130742.TXT
24450731	Aquatroll 400	1760	ADU-500 Velipoje	RS485	Level-C22	03/02/2022 13:07:24	-12.774	m						ADU-500_220203130742.TXT
24450732	Aquatroll 400	1760	ADU-500 Velipoje	RS485	Cond-C23	03/02/2022 13:07:24	643.259	µS						ADU-500_220203130742.TXT
24450733	Aquatroll 400	1760	ADU-500 Velipoje	RS485	pH-C24	03/02/2022 13:07:24	9.872	-						ADU-500_220203130742.TXT
24450734	Aquatroll 400	1760	ADU-500 Velipoje	RS485	ORP-C25	03/02/2022 13:07:24	-292.189	mV						ADU-500_220203130742.TXT
24450735	Aquatroll 400	1760	ADU-500 Velipoje	RS485	DO-C26	03/02/2022 13:07:24	-0.788	%						ADU-500_220203130742.TXT
24450736	Aquatroll 400	1760	ADU-500 Velipoje	RS485	1707-C92	03/02/2022 13:07:24	11270.1	µm						ADU-500_220203130742.TXT
24450723	Aquatroll 400	1760	ADU-500 Velipoje	RS485	Temp-C21	03/02/2022 12:57:24	16.624	°C						ADU-500_220203125742.TXT
24450724	Aquatroll 400	1760	ADU-500 Velipoje	RS485	Level-C22	03/02/2022 12:57:24	-12.789	m						ADU-500_220203125742.TXT



2. How the initiative/project accelerated/can accelerate progress towards the objectives of the International Water Action Decade and SDG 6

- Groundwater Aquifer and related groundwater dependent systems (GDE) provide a large number of ecosystem services that need to be protected in order to reach the SDGs.
- Protecting the aquifer system and the groundwater dependent ecosystems is linked to good understanding and assessment of this system which is to be moreover coordinated between two countries. This pilot project makes a difference in view of reaching SDG 6.
- Improving the knowledge and strengthening capacities for monitoring is a way forward the achievement SDG 6.



3. Lessons learned and future work required to achieve the objectives of the International Water Action Decade and SDG 6

- The project sets the framework to achieve a productive agreement that permits developing an integral and competent monitoring program that is the base to understand the aquifer system.
- The monitoring network for Albania and Montenegro which will permit both countries attaining the WFD goals by obtaining the necessary data to support management plans.
- Facilitate the information exchange on transboundary level with Montenegro;
- Use the data for scientific studies and monitoring of the groundwater transboundary aquifer.



4. Perspective of UNESCO's Component 2 "Management of Coastal Aquifers and Related Ecosystems"

Output 2.1 Detailed assessments of the current state of priority coastal aquifers and related coastal ecosystems, vulnerability maps and recommendations for land use planning addressing relevant stakeholders, including private sector, national and local water associations and water users;

Output 2.2 National Dialogues identifying potential conjunctive management solutions, including stakeholders' training modules designed and implemented;

Output 2.3 National Assessments of Submarine Groundwater Discharges and of Marine – Freshwater Interactions;

Output 2.4 Management plan for coastal aquifer "Buna-Bojana" produced including design and field testing of aquifer monitoring multi-purpose networks and protocols;

Output 2.5 Facilitation of broader adoption of approaches promoted by the project with attention on long term sustainability and engagement of private sector, national and local water associations and water users.

WRMA is working to include on these action all the components from the DCG (SAP) Strategic Action Plan and Drin-Buna River Basin Management Plan for Albania adopted by the Decision of Council of Ministers



Thank you



Email address: morgana.marku@ambu.gov.al



Website: <http://www.ambu.gov.al/>

